

HAER
CAL
54-THRIV.V,
3-

MARBLE FORK BRIDGE
Spanning Marble Fork of Kaweah River on
Crystal Cave Road
Sequoia National Park
Tulare County - *Three Rivers Vicinity*
California

HAER NO. CA-141

PHOTOGRAPHS

REDUCED COPIES OF MEASURED DRAWINGS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service

PO Box 37127

Washington, DC 20013-7127

HISTORIC AMERICAN ENGINEERING RECORD

MARBLE FORK BRIDGE
Sequoia National Park - *Three Rivers Vic.*
HAER No. CA-141

HAER
CAL
54-THRIV.V,
3-

Location: Spanning the Marble Fork of the Kaweah River on the Crystal Cave Road, Sequoia National Park, Tulare County, California.
USGS quadrangle: Giant Forest, California
UTM: 11/340240/4049110

Dates of Construction: 1919; alterations 1929 and 1934

Structural Type: 1919 - Concrete piers, log deck and truss
1929 - Concrete piers, log deck and steel truss
1934 - Concrete piers, concrete deck/steel truss

Contractor: 1919 - R.W. McKnight, Fresno, California
1929 - Judson Pacific Company

Designer: 1919 - George E. Goodwin, Chief Civil Engineer, National Park Service

1929 and 1934 - Thomas C. Vint, Chief, NPS Landscape Architecture Division (architectural plans)

Owner: Sequoia National Park, National Park Service

Use: Park road bridge, demolished 1993

Significance: The historic Marble Fork Bridge was an important link of the Giant Forest Road, or Crystal Cave Road, allowing for the extension of the Colony Mill Road to the Giant Forest. The bridge underwent a unique transformation from a log and concrete structure to a structure entirely of steel and concrete, abandoning the bridges original rustic appearance and character.

Project

Information: Documentation of the Marble Fork Bridge is part of the Generals Highway Recording Project, conducted in summer 1993 under the co-sponsorship of HABS/HAER and Sequoia National Park.

This is one in a series of reports prepared for the Generals Highway Recording Project, undertaken by the Historic American Engineering Record in summer 1993. HAER No. CA-140, GENERALS HIGHWAY, contains an overview history of the road.

Christina Slattery, HAER Historian, 1993.

INTRODUCTION

The historic Marble Fork Bridge was located on the Giant Forest Road (Crystal Cave Road) spanning the Marble Fork of the Kaweah River where the river cuts a narrow gorge through a granite ledge. The U.S. Army constructed the first bridge at the site in 1901 when it extended the Colony Mill road was extended from the Kaweah Colonists' mill to the Giant Forest. The army bridge was a wooden Pratt truss bridge; it survived only ten years before the logs rotted and a replacement bridge was planned.

MARBLE FORK BRIDGE - 1919

Uncertain which type of bridge to construct at the site, the National Park Service's Engineering Division prepared plans for three different types: steel, concrete arch, and rustic log. The steel bridge design was for "an overhead decked steel truss with steel bent viaduct type approaches to the span -having all steel floor joists on two foot centers and a three inch fir or pine floor and a suitable ornamental hand-rail, etc."¹ The concrete bridge design specified a spandrel arch approach bridge with concrete floor and ornamental balustrade. For the third type of bridge the specifications called for a "rustic log bridge with steel ties, tension members and steel bearing plates and housings, log bent approaches with wooden floor system and rustic handrail throughout."² When the project was advertised, proposals could be made on one or all of the three types of structures.

When no formal bids were received by the 10 October 1918 deadline, the bid date was extended to 15 November. On 11 October an informal bid was received from R. W. McKnight of Fresno for a log bridge costing \$4,411.³ The park asked McKnight to submit a formal bid before the November deadline, but he failed to do so and two other proposals were received for the bridge. N. M. Stark and Company of Des Moines, Iowa submitted a bid of \$19,000 for a concrete spandrel bridge, and Frederickson and Shannon of Fresno, California submitted the second bid, which

¹Bid contract for Marble Fork Bridge, September 16, 1918. Sequoia/Kings Canyon (SEKI) Archives, Box 156, no.11.

²*Ibid.*

³Correspondence, "Marble Fork Bridge Historic Resource File," Box 156, No.11, SEKI Archives.

was for a composite concrete arch span and stone approach bridge to cost \$26,294.⁴ Since both bids were too high, park officials decided that a log structure would be the most economical and the project was put out for rebid on 27 March 1919. Two designs for the log bridge were prepared that month by NPS Chief Civil Engineer George E. Goodwin. The plans utilized the same handrail, floor system, and concrete work, while design A was a through truss and design B was a deck truss. In the final bid period three bids were received ranging from \$8,844 for a modified design A or B structure to \$11,000 for design B. The contract was awarded to R. W. McKnight for a log bridge with a deck truss (design B) for \$10,187. McKnight completed the new bridge in July 1919; it was an 18' wide wooden structure, 200' in length with reinforced concrete piers, abutments, and retaining walls. The bridge was constructed with yellow pine logs from nearby forests.⁵

MARBLE FORK BRIDGE - 1929-1934

By May 1929, the new bridge had sagged in the central span and many of the timbers had rotted rendering the structure impassable. Sequoia National Park Superintendent John Roberts White encouraged the bridge's replacement, but no funds were available; the park was forced to do makeshift repairs using maintenance funds. It was necessary for the bridge to be stabilized, but as it was not economical to rebuild the 55' central truss with timbers, two alternative plans were completed by NPS Chief Landscape Architect Thomas C. Vint in June 1929. These called for replacing the central span with either steel trusses or girders. A steel truss was decided on and the Judson Pacific Company completed the replacement span on 30 July 1929. The steel work was painted green to make it blend with the surrounding landscape.⁶ The structure was now a combination bridge of steel and concrete with a log deck and railing. More alterations were made in 1932, when the log deck was replaced with concrete and funding was received for the girder span and approach replacement. The bridge underwent its final transformation with the replacement of the unstable log railing with a low steel railing. The idea for a replacement railing of

⁴Ibid.

⁵Ibid.

⁶Ibid.

either steel or iron had been initiated in 1932, but funding was unavailable. Vint prepared plans for the replacement railing in 1933 by Vint and the reconstruction was let for bid. The low bid of \$561.50 was accepted, but the railings were not replaced at this time.⁷ This was finally done in 1934 by Civilian Conservation Corps enrollees. This last transformation totally eliminated the rustic appearance of the original wooden bridge; with the replacement of materials over time, the structure had been transformed to steel and concrete.

MARBLE FORK BRIDGE - 1993

After nearly three-quarters of a century of service, the second Marble Fork Bridge was demolished in 1993. Deferred maintenance had failed to prevent the deterioration of the concrete abutments, dating to the original construction in 1919, and the 1932 steel girders. The bridge demolition began in May 1993, and the construction of a replacement structure soon followed. The new bridge design was prepared by the Federal Highway Administration in conjunction with the Denver Service Center of the National Park Service. The project was advertised on 15 September 1993 and the contract was subsequently awarded to the David A. Mowat Company of Kirkland, Washington for \$1,701,151. The design is for a reinforced concrete structure faced with a veneer of texturized concrete having a stone appearance. The new bridge is projected to be completed by 31 May 1994.

⁷John Roberts White, Superintendent, Sequoia National Park, to Chief Engineer, Bureau of Public Roads, 10 September 1932. SEKI Archives.

BIBLIOGRAPHY

Information for this report was obtained from drawings and correspondence located in the Sequoia National Park archives (abbreviated as SEKI Archives).

Bid Contract for Marble Fork Bridge, 16 September 1918. SEKI Archives, Box 156, No.11.

"Marble Fork Bridge." Historic Resource File, SEKI Archives, Box 156 No.11.

White, John Roberts, Superintendent, Sequoia National Park, to Chief Engineer, Bureau of Public Roads, 10 September 1932. SEKI Archives.